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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,385	08/16/2006	Gerald Hohenbichler	P/3240-113	3884

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EXAMINER	
D'ANIELLO, NICHOLAS P	

ART UNIT	PAPER NUMBER
1793	

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10/20/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/581,385	HOHENBICHLER ET AL.	
	Examiner	Art Unit	
	Nicholas P. D'Aniello	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 August 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-26* is/are rejected.

7)☒ Claim(s) *27* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8-11-2009 has been entered.

Claim Objections

Claim 16 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The limitation of claim 16 is already present in the independent claim.

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-2 and 4-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wright (EP0887129, as cited on IDS) with supporting evidence from Wilson et al. (USP 4,098,321 a newly cited reference).

In regards to claims 1 and 22-24, Wright teaches a method of sequence casting for the continuous production of metal strips, slabs, or other forms, wherein molten metal is fed from a ladle (melt vessel) to a tundish and from the tundish to a mold (see column 1, lines 43-51) wherein during the change-over from one ladle to the next an interruption of the inflow into the tundish occurs and upon resumption of the supply the inflow rate of molten metal from the ladle to the tundish is 1.5 times the casting flow (outflow) or greater (for the whole time, i.e. at least 70%) (see column 2, lines 8-19) thus overlapping with the instantly claimed range. Overlapping ranges have been held to establish prima facie obviousness (see MPEP 2144.05). Wright teaches a "quasi-steady" bath level via the use of a tilting tundish mechanism (see Figure 3).

In regard to **the amendment** (and claim 16), Wright does not teach that the feeding of the metal melt into the tundish during the last 5-30% of the first time period if continued at a reduced flow rate. However, Wilson et al. teach that the during casting of molten metal when a melt vessel (pouring pot 10) is used to deliver molten metal to a mold the flow rate (discharge velocity of molten metal = v) from the vessel is proportional to the static pressure heard h (height of molten metal in the vessel), such that as the amount of metal in the vessel decreases, the flow rate decreases (column 3 line 61 - column 4 line 45).

Therefore, it is taken to be inherent in the casting process of Wright that during the last 5-30% of the first time period (when the casting ladle is almost empty) that the flow rate of the molten metal (feeding of metal melt) is performed at a reduced inflow rate compared with the preceding part of the first time period because the amount of

molten metal in the ladle (static pressure head) when the ladle first starts pouring is much higher (resulting in a much higher flow rate) and during the last 5-30% of the first time period the amount of molten metal in the ladle is drastically reduced (low static pressure head) resulting in a reduced inflow rate.

In regards to claim 2, Wright teaches an inflow rate which is 1.5 or more time greater than the outflow rate (see above) which corresponds to the "maximum inflow rate during steady-state casting" wherein the inflow and outflow rates are equal, and thus reads on the instant claim.

In regard to claims 4, 5, 16, 17 and 25, similar to the reasoning of the **amended** content above, the amount of molten material is greatest immediately prior to the resumption of feeding therefore it is taken to be inherent in the process of Wright et al. that the inflow rate during the first part of the first time period is the maximum inflow rate (due to the highest amount of static pressure from the ladle being full) which then decreases continuously as the metal is poured (resulting in reduced filling rate during the remainder of the first time period).

In regards to claim 6, Wright teaches that the supply of molten metal into the tundish is interrupted while a constant head level and casting rate is maintained (see col 2, ln 31-36), deemed equivalent to the instant claim.

In regards to claim 7 and 26, the reference differs in that it does not disclose the interruption times as required by the instant claims. However, Wright establishes that the timing of the interruption is a result effective variable (see col 4, ln 2-10). It would have been obvious to one of ordinary skill in the art at the time the invention was made

to choose the instantly claimed ranges through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to do so in order to minimize variation and contaminants in the cast metal and to maximize industrial applicability of the invention.

In regards to claim 8, Wright teaches the use of tundish powders (see col 7, ln 23-31) in order to protect the metal from oxidation, deemed equivalent to the instant claim.

In regards to claims 9-10 and 14, Wright teaches the use of control valves on the melt vessel, control of the tundish utilizing mass sensing and/or level sensing (see col 7, ln 13-15) and further teaches that the inflow of molten metal into the tundish relative to the outflow (discharge) is a result effective variable. It would have been obvious to one of ordinary skill in the art to control the supply of metal and bath level in view of the teaching of Wright in order to maintain the quality of the cast metal, increase efficiency, and enhance the industrial applicability of the method.

In regards to claim 11, Wright teaches the casting of a steel strip on a two roller casting machine (see Figure 1) and teaches flow rates of metal between 5-150 tons/hour (see col 3, ln 20-21) which overlap with the instantly claimed ranges. It would have been obvious to one of ordinary skill in the art to select from the portion of the overlapping ranges, in order to enhance efficiency while minimizing cast defects. Overlapping ranges have been held to establish prima facie obviousness (see MPEP 2144.05).

In regards to claims 12-13, Wright teaches the use of tundish powders (equivalent to covering agent) in an area with low turbulence (see col 7, ln 23-31).

In regards to claim 15, Wright teaches the use of a divider plate (see Figure 3) which divides a tundish into two partial quantities, where molten metal is fed from a ladle to the first partial quantity, continuously transferred to the second partial quantitiy, and teaches where the inflow to the first quantity (inflow from ladle) is 1.5 times or greater the outflow from the second partial quantity (casting outflow)(see above) thus overlapping with the instantly claimed range. It would have been obvious to one of ordinary skill in the art to select from the portion of the overlapping ranges, in order to enhance casting efficiency while minimizing cast defects. Overlapping ranges have been held to establish prima facie obviousness (see MPEP 2144.05).

In regards to claims 18-19, Wright teaches a divider plate dividing a tundish into two quantities with an opening (free space) between the divider plate and the base of the tundish (see Figure 3).

In regards to claim 20, Wright teaches the use of control valves on the melt vessel, control of the tundish utilizing mass sensing and/or level sensing (see col 7, ln 13-15) and further teaches that the inflow of molten metal into the tundish relative to the outflow (discharge) is a result effective variable. It would have been obvious to one of ordinary skill in the art to control the supply of metal into the tundish as a function of the outflow of metal from the tundish in view of the teaching of Wright in order to maintain the quality of the cast metal, increase efficiency, and enhance the industrial applicability of the method.

In regards to claim 21, Wright teaches the use of steel (see col 4, ln 37-40).

Allowable Subject Matter

3. Claim 27 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The closest prior art, Wright et al., teaches a casting process where the molten metal inflow rate is to the tundish is 1.5 times the outflow rate and inherently has a reduced inflow rate during the last section the of the first time period. However, the prior art as a whole fails to teach or fairly render obvious claim 27 as a whole (taken with independent claim 1), specifically claim 27 defines over Wright et al. in requiring that at the end of the first time period an ***unchanging*** filling rate of the tundish equal to a rate of discharging the melt is attained.

Response to Arguments

After further search and consideration the flow rate of Wright is taken to inherently meet the claimed limitations as the flow rate is proportional to the amount of material in the vessel as disclosed by Wilson et al.

Inquiries

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicholas P. D'Aniello whose telephone number is (571)270-3635. The examiner can normally be reached on Monday through Thursday from 8am to 5pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on (571) 272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N. P. D./
Examiner, Art Unit 1793

/Jessica L. Ward/
Supervisory Patent Examiner, Art Unit 1793